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- 2241411 8/1991 United Kingdom.

OTHER PUBLICATIONS

- Autonomous Inter-base-station Synchronization for TDMA Microcellular Systems, Akaiwa et al., The Institute of Electronic Information Communication Engineers in Japan, National Spring Meeting, 1991 B-334.
Improved Scheme of Autonomous Inter-base-station Synchronization, Akaiwa et al., "The Institute of Electronic Information Communication Engineers in Japan", National Autumn Meeting, 1991 B-251.

(List continued on next page.)

Related U.S. Application Data

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[57] **ABSTRACT**

- A method for establishing inter-base-station synchronization among a plurality of radio base stations of a mobile radio communication system. Each radio base station transmits a radio frequency control signal including priority information identifying the priority of the transmitting station as it relates to establishing synchronization, and synchronization establishing information indicating whether synchronization has been previously established between the transmitting base station and any other radio base station. The receiving radio base station synchronizes with the transmitting base station if the receiving base station has not previously established synchronization, and based on the priority information contained in the received radio frequency control signal, the receiving station is determined to be allowed to establish synchronization with the transmitting base station, and further if the synchronization establishing information contained in the control signal indicates that the transmitting base station has previously been synchronized. Once the receiving base station synchronizes with the transmitting base station, the priority of the receiving base station is changed to be equal to the priority of the transmitting base station.

- A method for establishing inter-base-station synchronization among a plurality of radio base stations of a mobile radio communication system. Each radio base station transmits a radio frequency control signal including priority information identifying the priority of the transmitting station as it relates to establishing synchronization, and synchronization establishing information indicating whether synchronization has been previously established between the transmitting base station and any other radio base station. The receiving radio base station synchronizes with the transmitting base station if the receiving base station has not previously established synchronization, and based on the priority information contained in the received radio frequency control signal, the receiving station is determined to be allowed to establish synchronization with the transmitting base station, and further if the synchronization establishing information contained in the control signal indicates that the transmitting base station has previously been synchronized. Once the receiving base station synchronizes with the transmitting base station, the priority of the receiving base station is changed to be equal to the priority of the transmitting base station.

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